

## WHAT IS CLAIMED IS:

1. An apparatus for remote delivery and manipulation of a miniature tool adjacent a work piece in a restricted space, comprising:
  - a) a tool carrier;
  - b) a carriage for manipulating said tool carrier relative to a work piece; and
  - c) a remote actuator for operating said carriage.
2. The apparatus of Claim 1, further comprising:
  - a) means for delivery of said tool carrier in a restricted space.
3. The apparatus of Claim 1, further comprising:
  - a) a track member operably connected to said carriage; and
  - b) said remote actuator comprising a hydraulic actuator.
4. The apparatus of Claim 3, further comprising:
  - a) a plurality of said track members operably connected to said carriage; and
  - b) said track members being movable relative to said carriage.

5. The apparatus of Claim 4, wherein:
- a) one of said track members is movable independent of the other track members.
6. The apparatus of Claim 4, wherein:
- a) said hydraulic actuator comprises a plurality of actuator pistons; and
  - b) each of said track members is independently operated by a respective carriage piston.
7. The apparatus of Claim 6, wherein:
- a) a displacement of a carriage piston is substantially similar to a displacement of a corresponding actuator piston.
8. The apparatus of Claim 7, further comprising:
- a) means for synchronizing a displacement of a carriage piston with a displacement of a corresponding actuator piston.

9. The apparatus of Claim 8, further comprising:
- a) hydraulic lines for connecting said actuator pistons with said carriage pistons; and
  - b) means for pressurizing said hydraulic lines.
10. The apparatus of Claim 1, further comprising:
- a) a secondary actuator for operating said remote actuator.
11. The apparatus of Claim 10, wherein:
- a) said secondary actuator is positioned remote from said remote actuator.
12. The apparatus of Claim 11, further comprising:
- a) means for detecting the position of the miniature tool relative to a work piece.
13. The apparatus of Claim 12, wherein:
- a) the miniature tool comprises an ultrasonic testing probe; and
  - b) said position detecting means comprises an encoder operably connected to said remote actuator.

14. The apparatus of Claim 13, further comprising:
- a) imaging means for displaying information about the work piece.
15. The apparatus of Claim 1, wherein:
- a) the miniature tool comprises an ultrasonic testing probe.
16. An apparatus for remote delivery and manipulation of a miniature tool adjacent a work piece in a restricted space, comprising:
- a) a tool carrier;
  - b) carriage means for manipulating said tool carrier relative to a work piece;
  - c) a hydraulic actuator for operating said carriage means; and
  - d) means for delivery of said tool carrier in a restricted space.
17. The apparatus of Claim 16, further comprising:
- a) first means for moving said tool carrier in a circumferential direction of the work piece.

18. The apparatus of Claim 17, wherein:
- a) said first means comprises a track member operably connected to said carriage means and being movable relative thereto.
19. The apparatus of Claim 16, further comprising:
- a) second means for rotating said tool carrier relative to the work piece.
20. The apparatus of Claim 19, wherein:
- a) said second means comprises a plurality of track members operably connected to said carriage means; and
  - b) each said track member is independently movable relative to said carriage means.
21. The apparatus of Claim 19, further comprising:
- a) third means for moving said tool carrier axially along the work piece.
22. The apparatus of Claim 21, wherein:
- a) said third means comprises said tool carrier delivery means.

23. The apparatus of Claim 16, wherein:

- a) said carriage means comprises a plurality of movable track members; and
- b) said carriage means comprises a piston for moving one of said track members.

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24. The apparatus of Claim 23, wherein:

- a) said carriage means comprises a plurality of first pistons each for moving a corresponding track member.

25. The apparatus of Claim 24, wherein:

- a) said hydraulic actuator comprises a plurality of second pistons corresponding to said first pistons.

26. The apparatus of Claim 25, further comprising:

- a) means for synchronizing a displacement of one of said first pistons with a displacement of a corresponding second piston.

27. The apparatus of Claim 26, further comprising:
- a) hydraulic lines for connecting said first and second pistons;  
and
  - b) means for pressurizing said hydraulic lines.
28. The apparatus of Claim 25, wherein:
- a) said first and second pistons comprise double acting pistons.
29. The apparatus of Claim 16, further comprising:
- a) a secondary actuator for operating said hydraulic actuator.
30. The apparatus of Claim 29, wherein:
- a) said secondary actuator is positioned remote from said hydraulic actuator.
31. The apparatus of Claim 30, further comprising:
- a) means for detecting the position of the miniature tool relative to a work piece.

32. The apparatus of Claim 31, wherein:
- a) the miniature tool comprises an ultrasonic testing probe; and
  - b) said position detecting means comprises an encoder operably connected to said hydraulic actuator.
33. The apparatus of Claim 32, further comprising:
- a) imaging means for displaying information about the work piece.
34. A method of remote delivery and manipulation of a miniature tool adjacent a work piece in a restricted space, comprising the steps of:
- a) providing a manipulator apparatus, comprising:
    - i) a tool carrier;
    - ii) a carriage assembly for manipulating the tool carrier relative to a work piece, the carriage assembly including first and second movable track members;
    - iii) the carriage assembly including first and second pistons for operating the first and second track members, respectively; and

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- iv) a remote hydraulic actuator for operating the carriage assembly;
- b) delivering the manipulator apparatus by a conveyor and positioning adjacent a desired area of the work piece; and
- c) operating the carriage assembly by actuating the remote hydraulic actuator thereby causing one or both track members to move relative to the work piece.

35. The method of Claim 34, wherein:

the step c) comprises moving the first and second track members substantially simultaneously to thereby cause the tool carrier to move along a single direction relative to the work piece.

36. The method of Claim 34, wherein:

the step c) comprises moving only one of the first and second track members to thereby cause the tool carrier to rotate relative to the work piece.